

ONE RELATION TO RULE THEM ALL

The point-to-point relation that substitute the existing ones

AND OTHER INTERESTING ISSUES

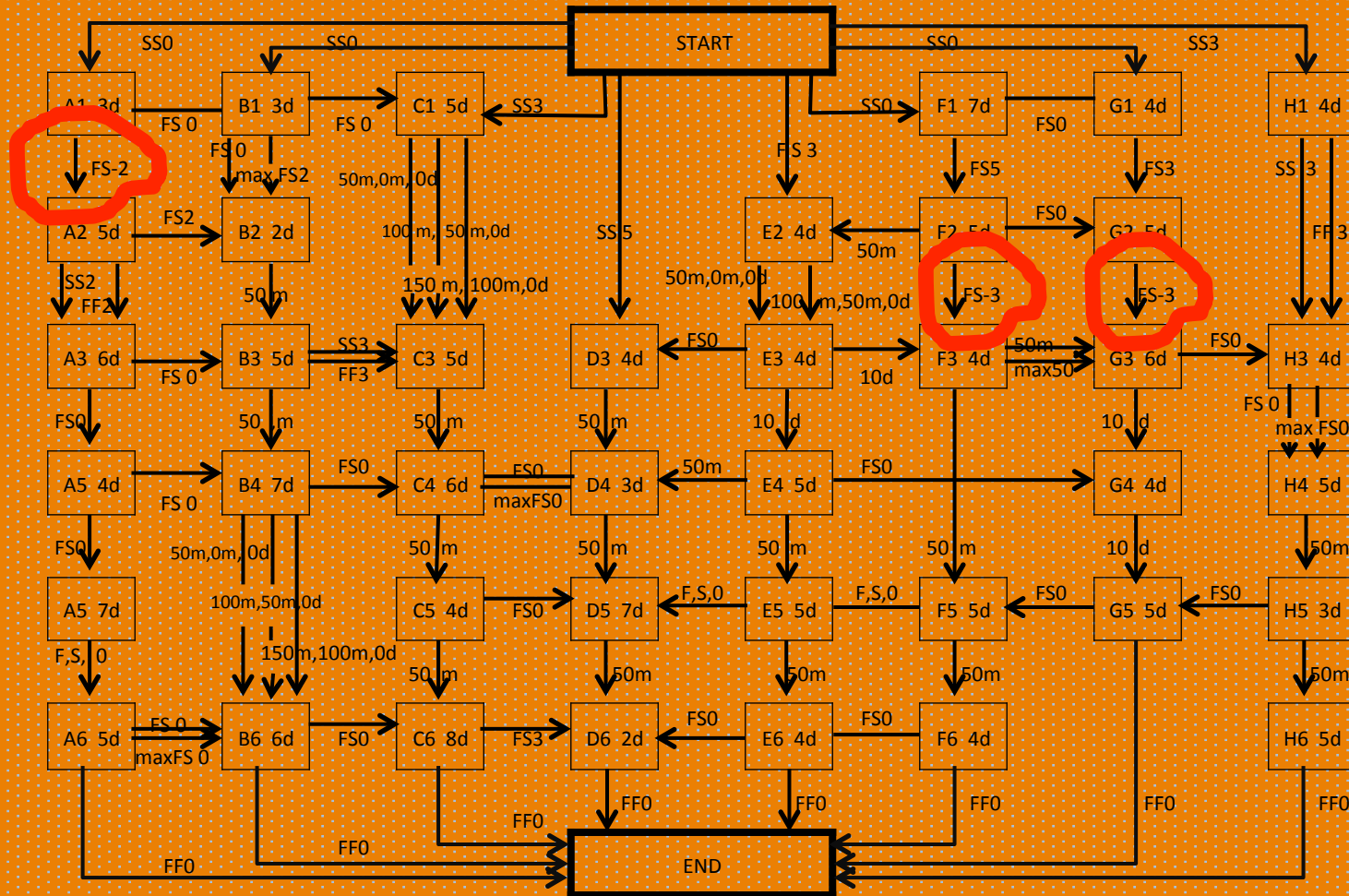
Such as the characteristics of critical activities
when point-to-point relations are in use
or continuous relations

or relations without direction.

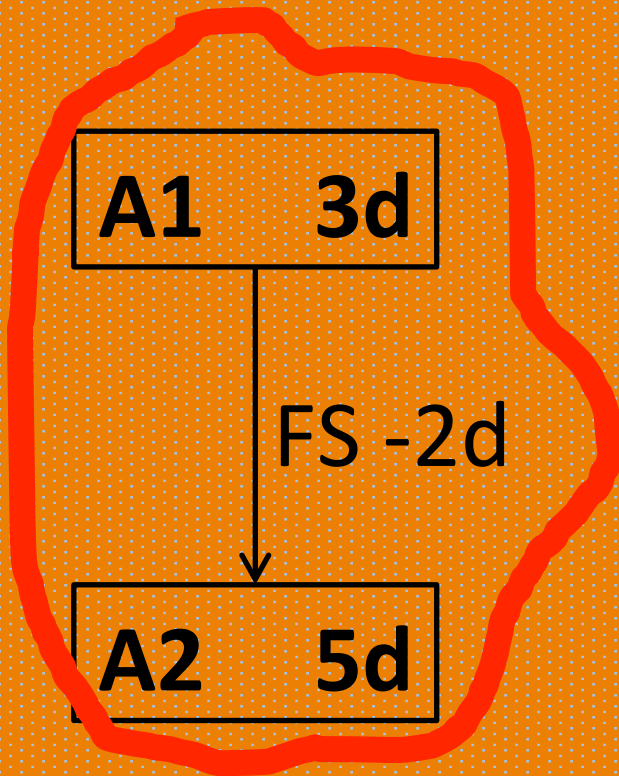
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Technology

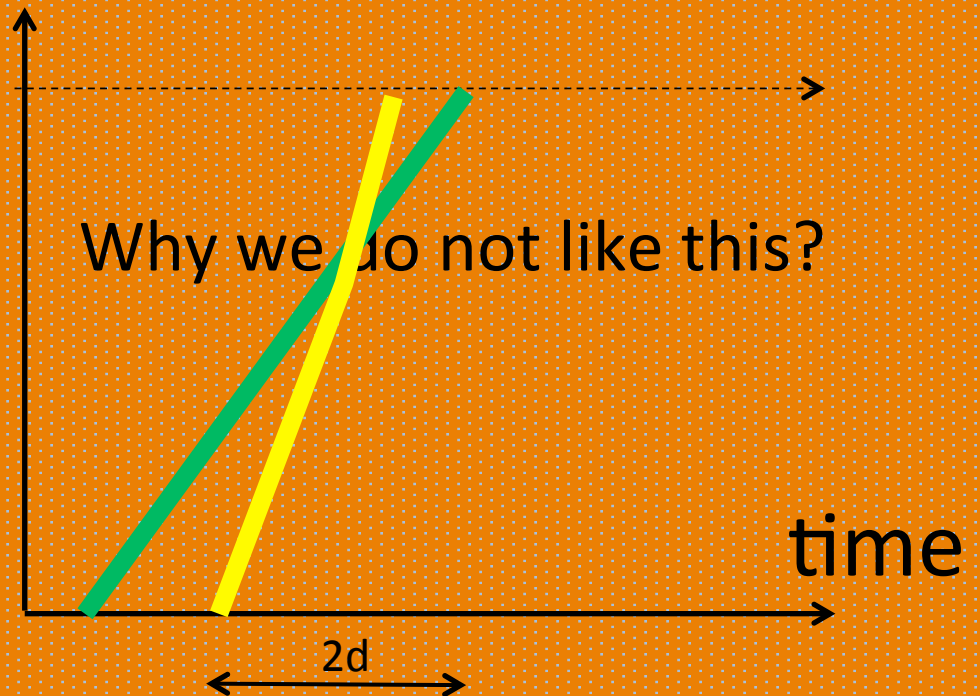
Things we do not like in this network...



Negative lag

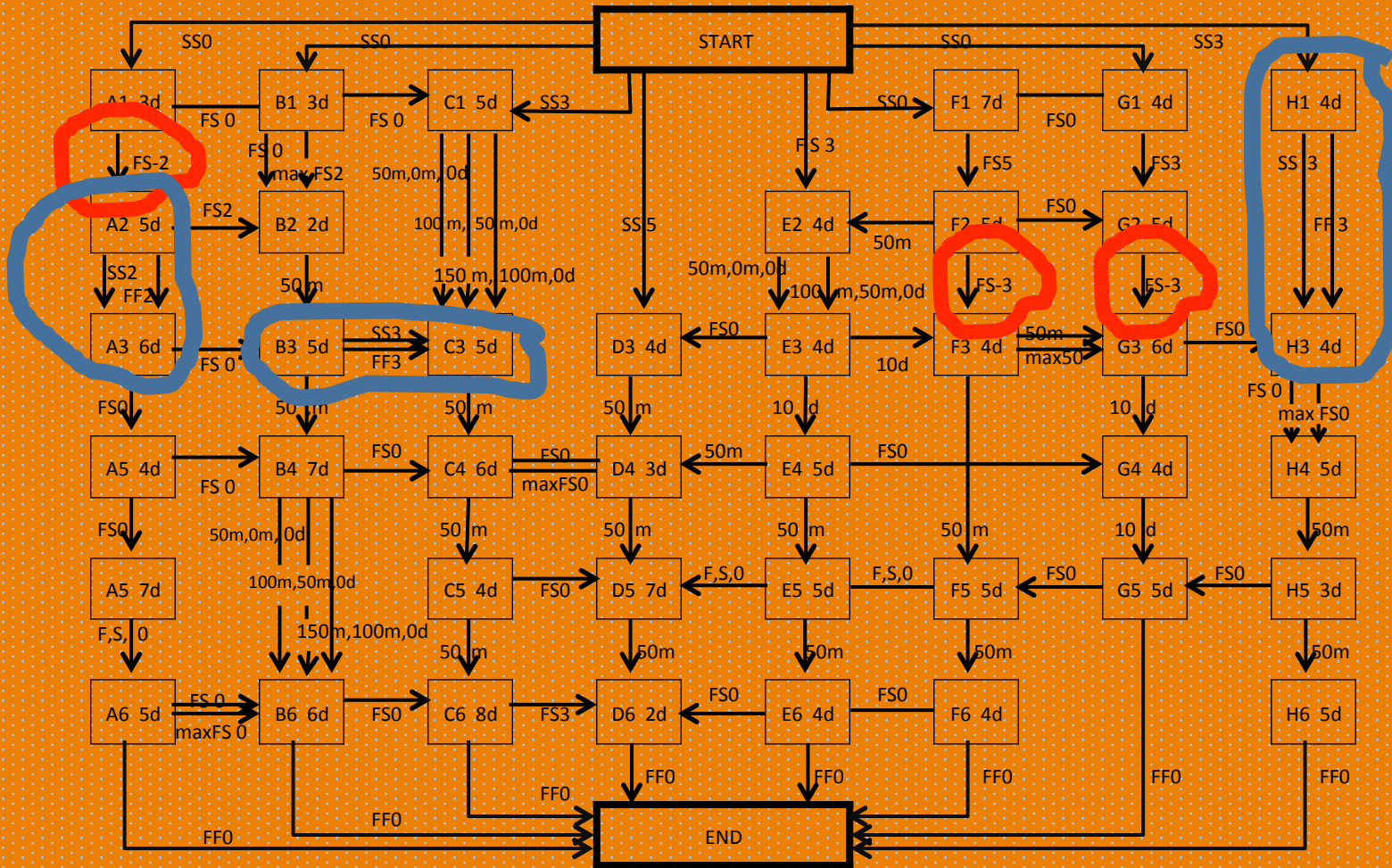


location

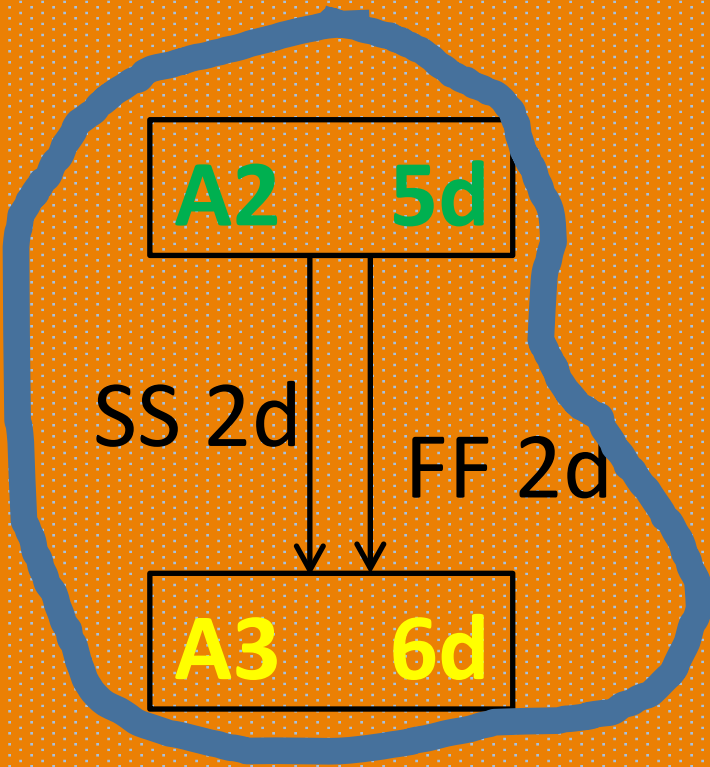


Only one point is under control..... and we can control it only in the future ...

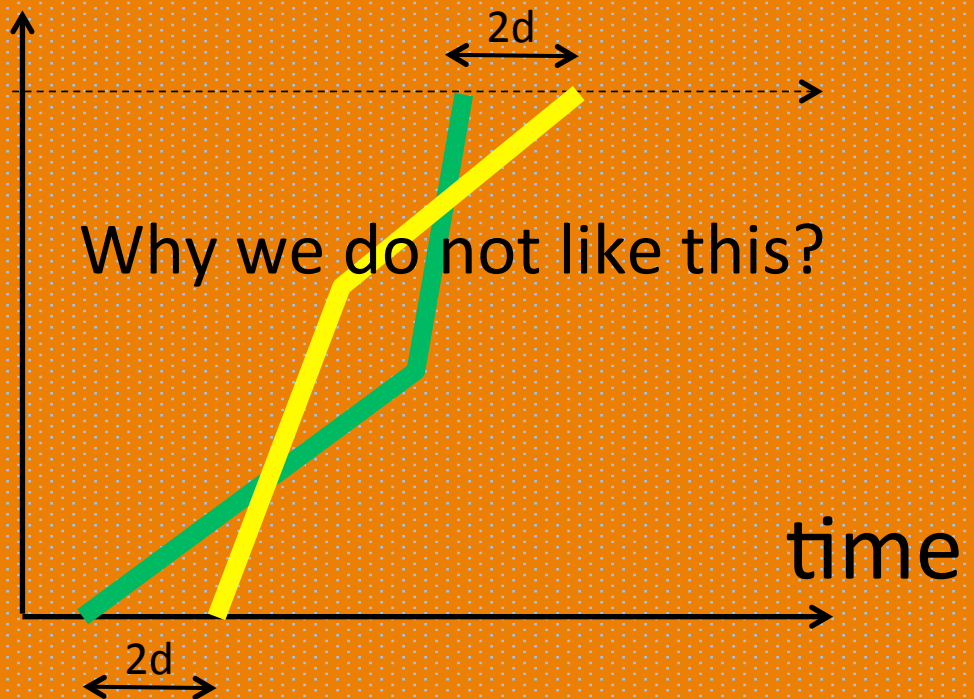
Things we do not like in this network...



Combination of SS and FF ...

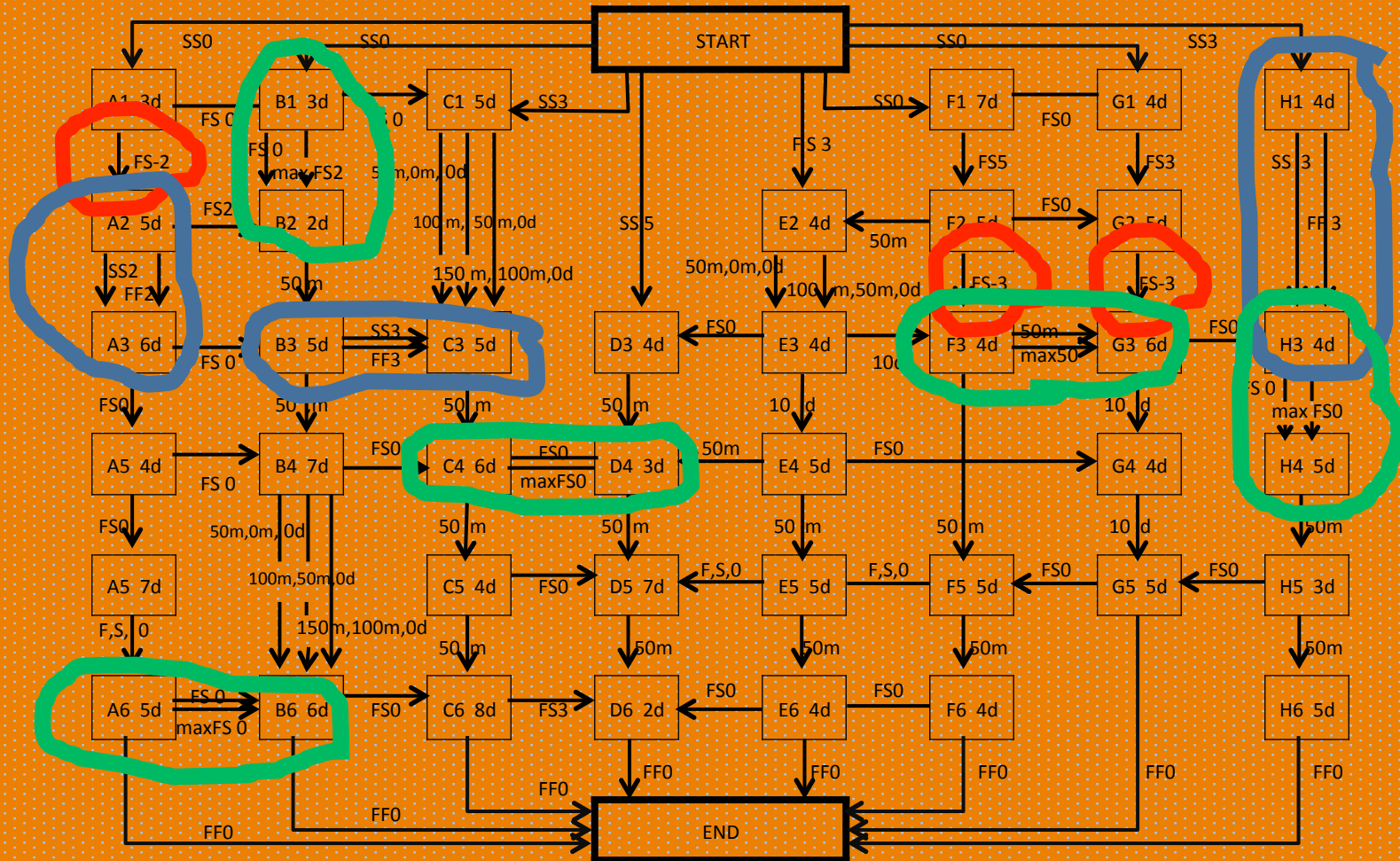


location

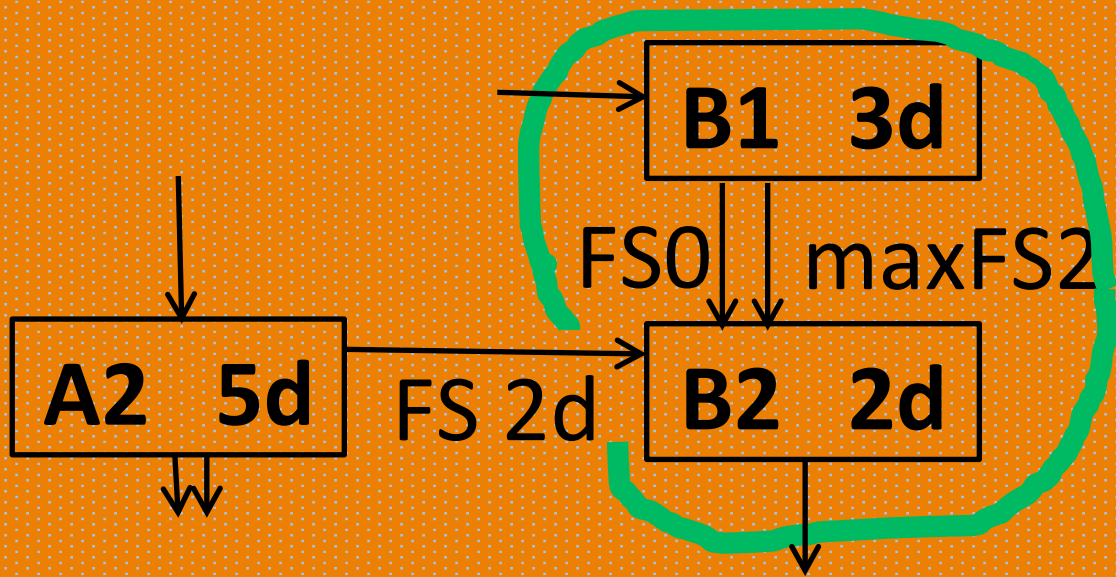


Only two points are under control..... anything can happen between them

Things we do not like in a network...

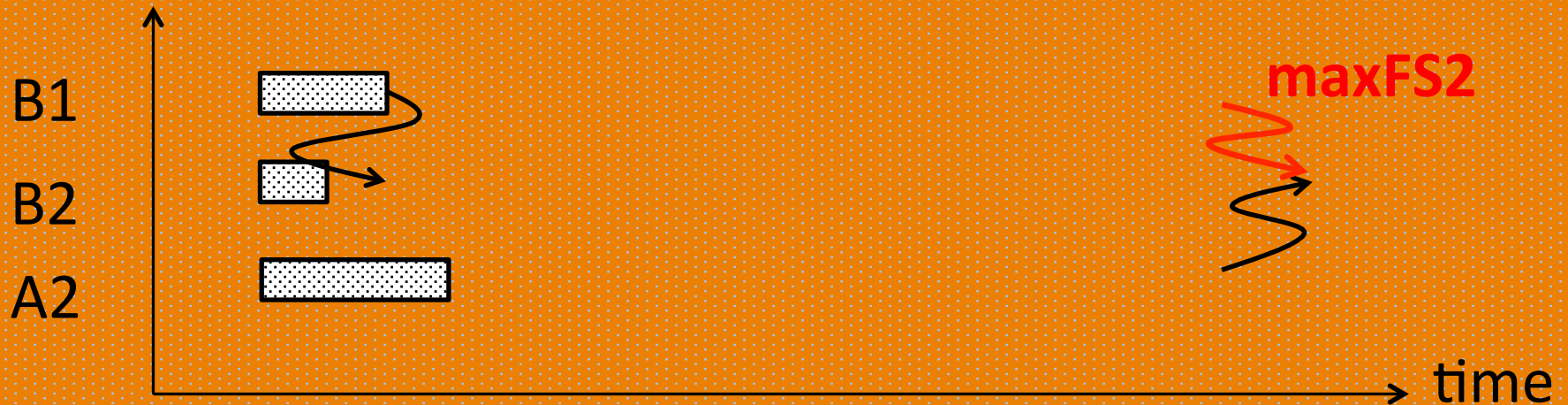


Maximal relations...

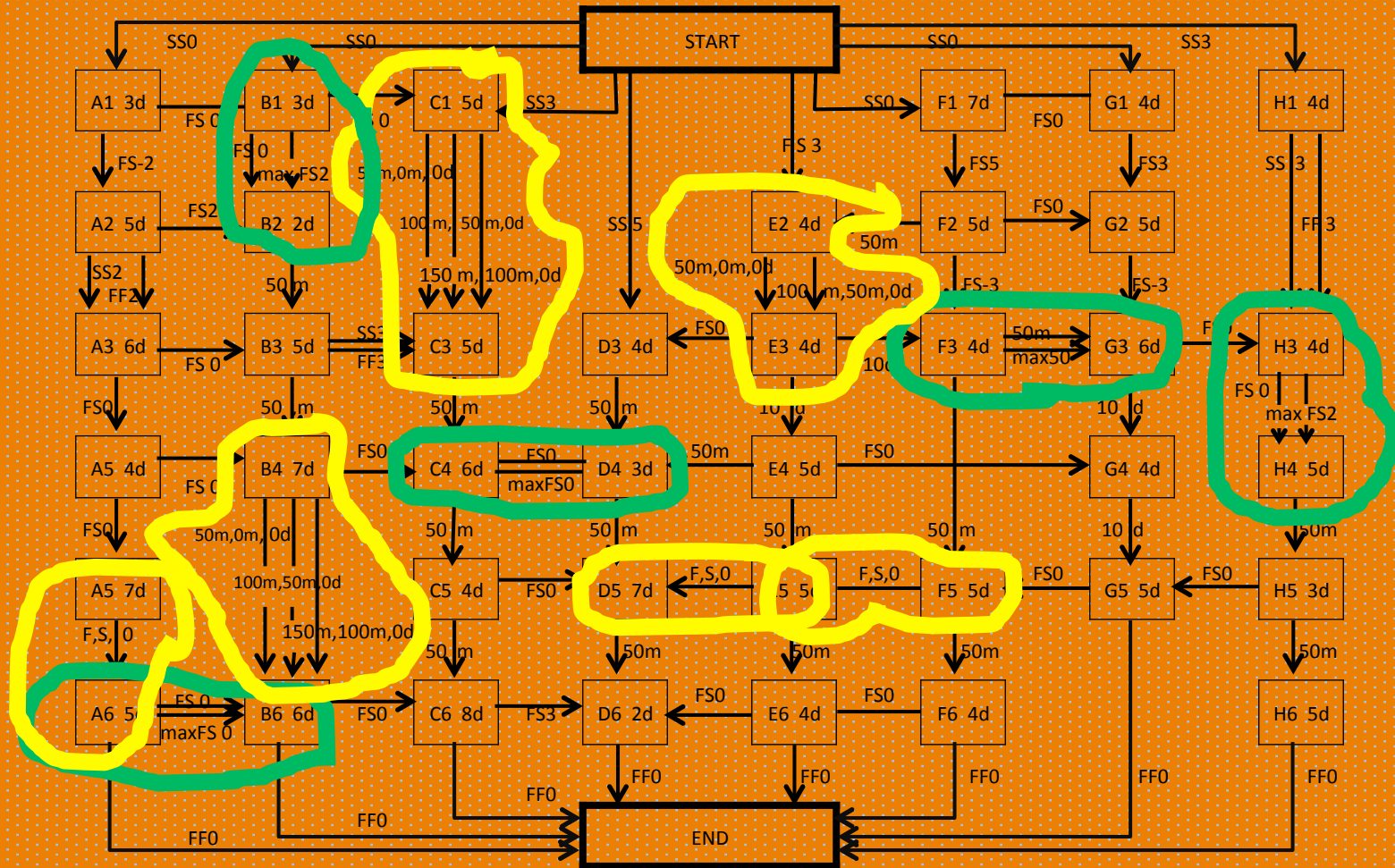


B1 - excavation for basements
B2 - retaining wall

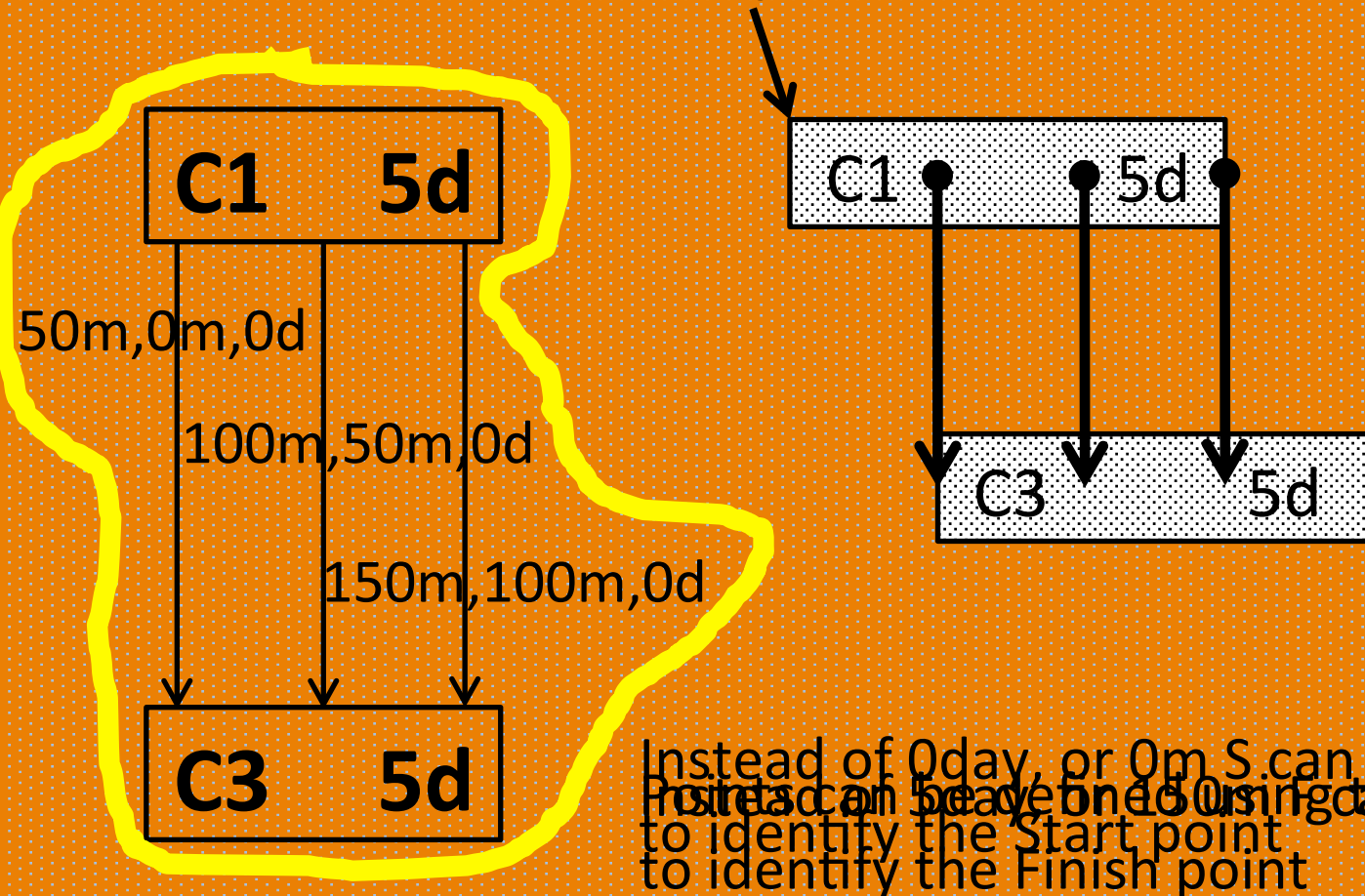
activities



Things we do not understand yet...



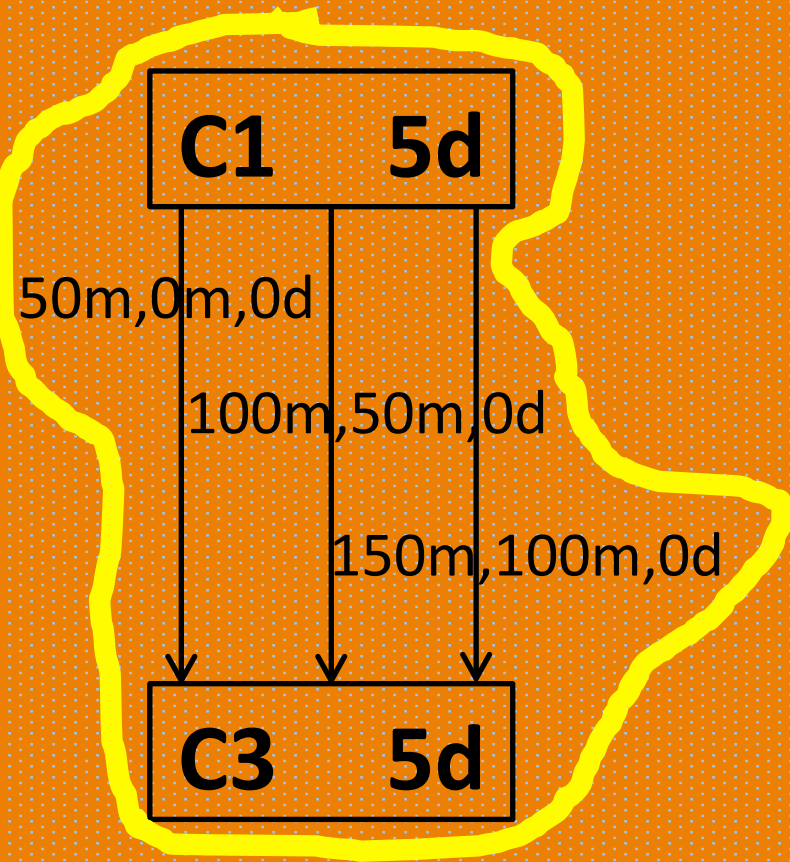
Point-to-point relations...



Instead of 0day, or 0m S can be used
Points can be defined using same data
to identify the Start point
to identify the Finish point

Conclusion: Point-to-point relations can replace the traditional four precedence relationships

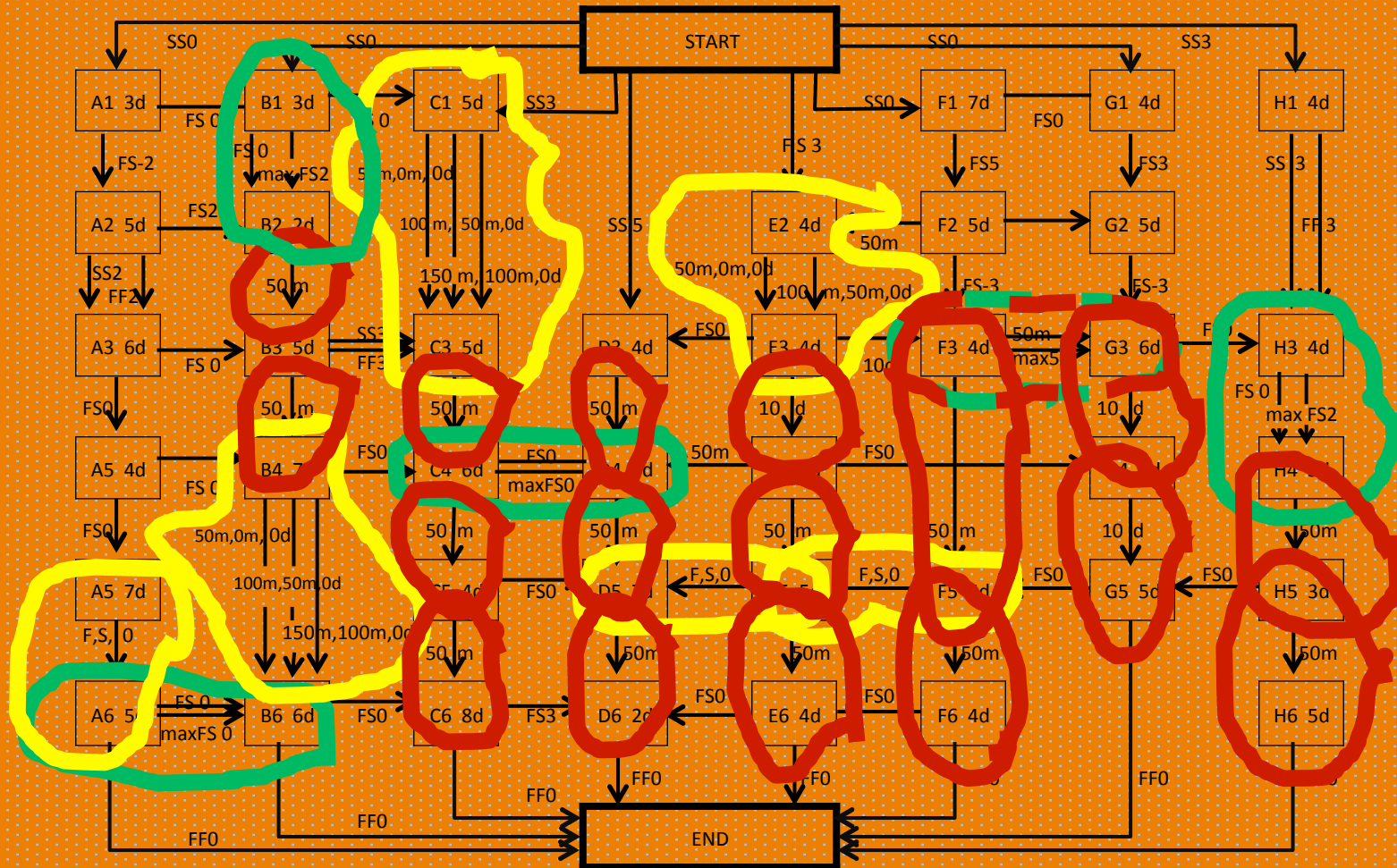
Point-to-point relations...



Francis and Miresko	2000
Plotnick	2004
Ponce de Leon	2008
Kim	2010
Hegazy	2010
Liberzon (Spider Project)	2010

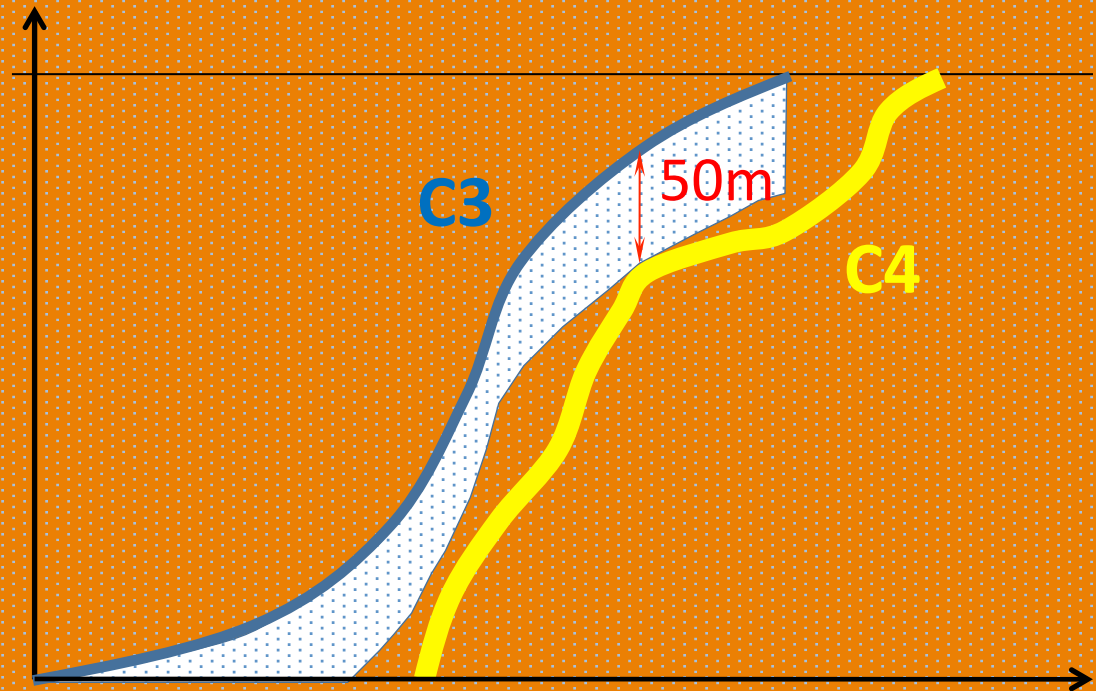
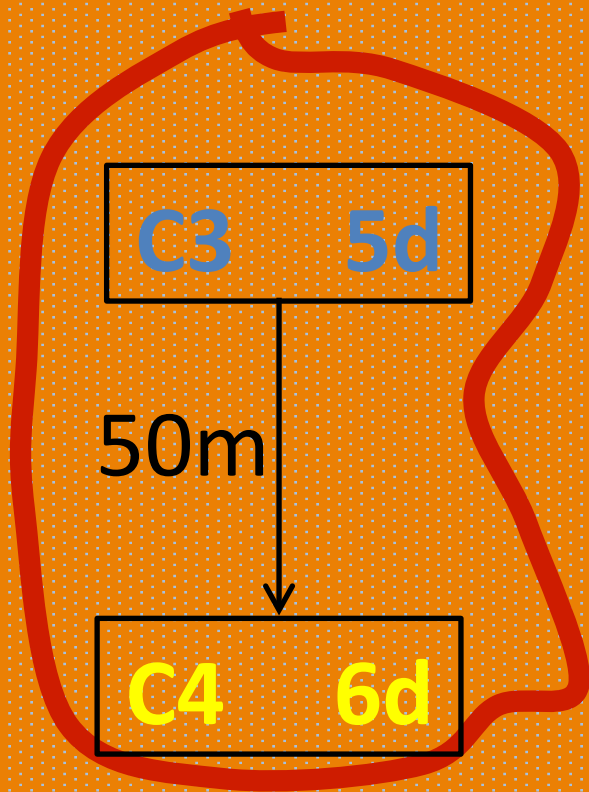
The mathematical model, that handle both minimal and maximal relations and the algorithm is in the paper.

Things we do not understand yet...



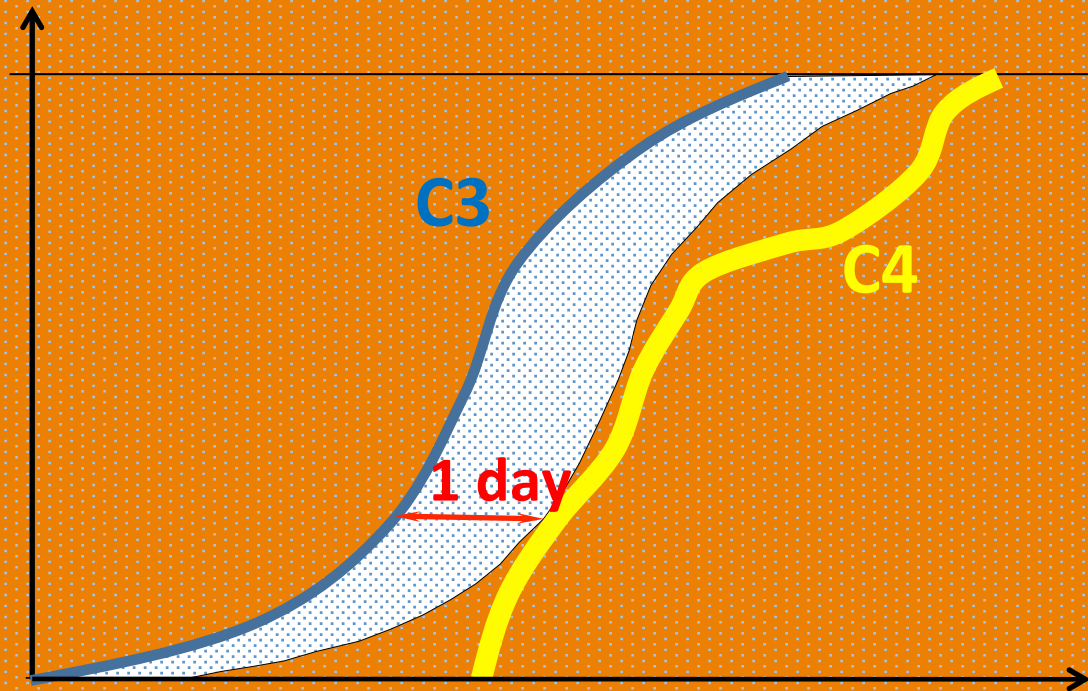
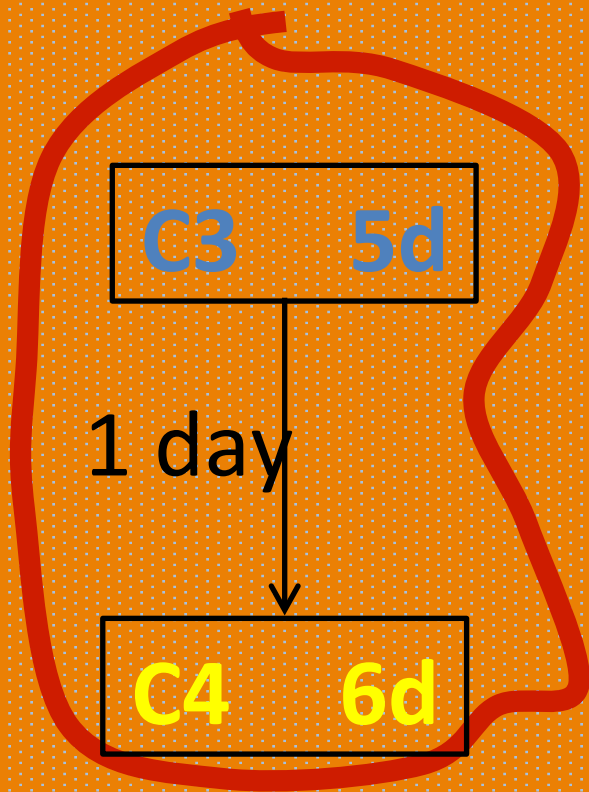
Continuous relations....

Control all the points that belong to the same time
(volume/location lag)



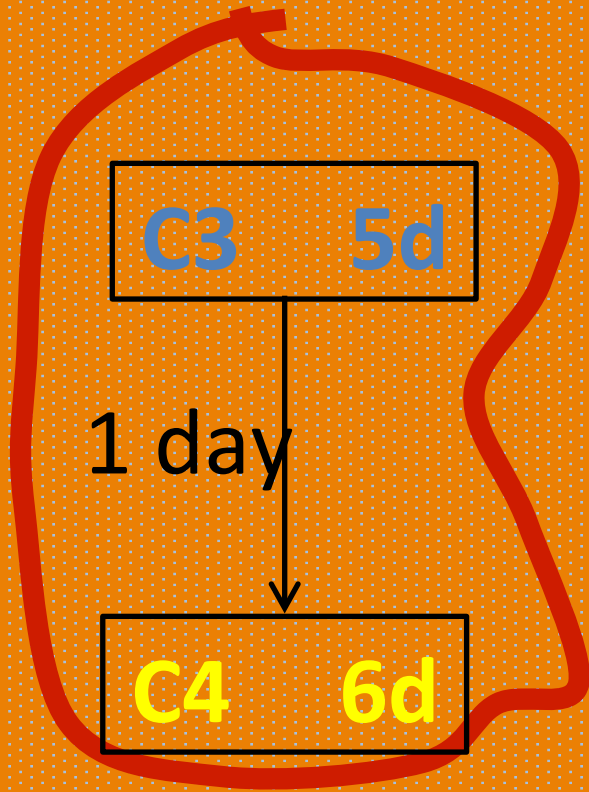
Continuous relations.....

...or belong to the same location (time lag)

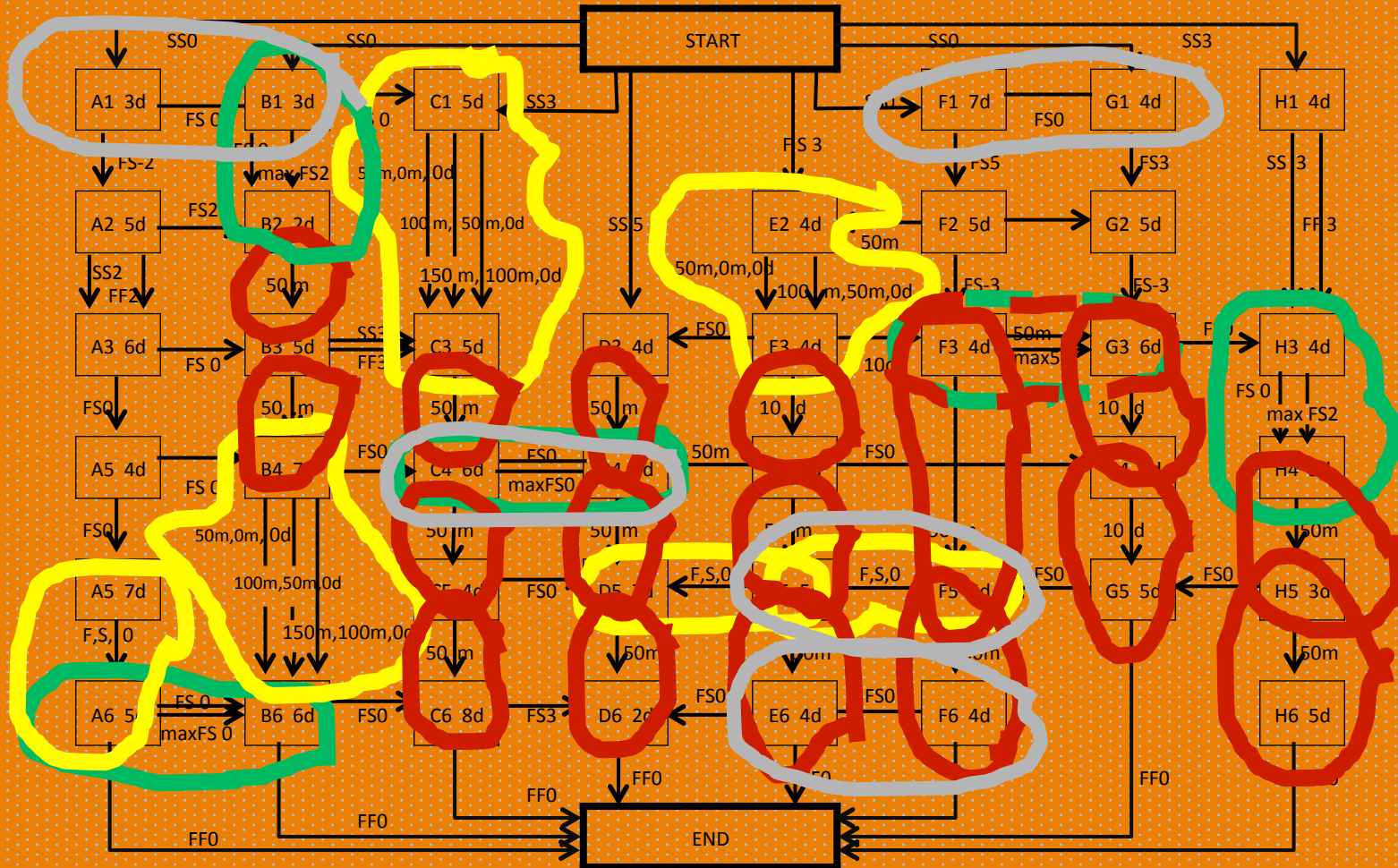


Continuous relations.....

Model, algorithm with minimal and maximal time and volume lags can be seen at

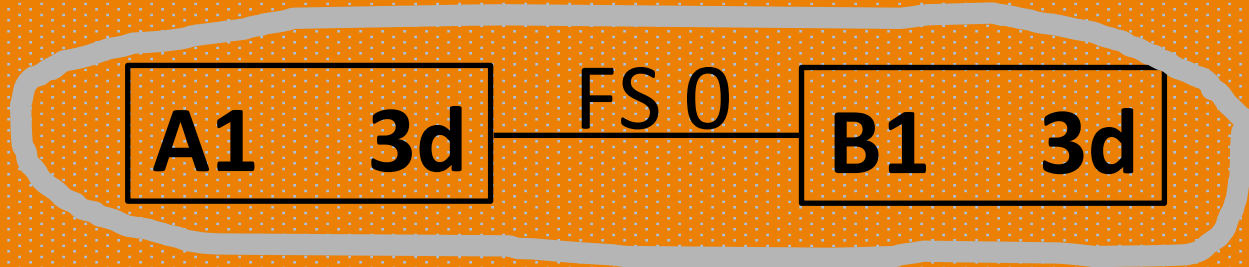


Things we do not understand yet...



Relationships without direction...

This can be



this



or this



Can be seen at



from



Conclusions

- Using negative lag for modeling overlapping is the worst practice
- Combination of SS and FF is a bit better, at least the start and the finish points are under control
- Point-to-point relations are acceptable from practical point of view. The number of controlled points is upon the planner discretion. (Minimal and maximal lags are allowed)
- Continuous relations are the best for modelling activity overlapping. All the points are under control. (Time and volume lags, maximal and minimal lags can be used.)
- Relations without directions are useful for describing relations connected to scarce resources.

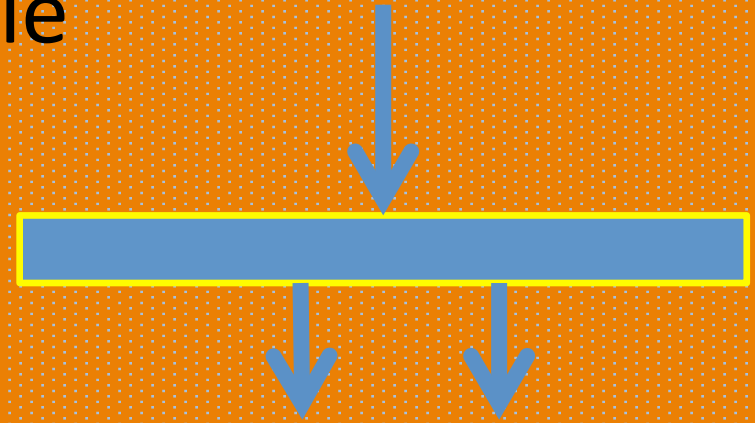
Discussions

- Due to the new type of precedence relations such as point-to-point, continuous and undirected relationships all the former definitions, developments, problems, algorithms that were based on the traditional four relationships must be examined again.
- Examples are could be: definition of floats, critical path, critical activity characteristics, time-cost trade off problems, resource leveling and allocation problems etc.

A short example

Is this a characterization valid in case of
• non critical, or
• critical, or
• neutral, or
• continuous relations?

- reverse critical, or
- bi critical, or
- decreasing neutral increasing normal critical, or
- decreasing reverse increasing neutral critical activity?



Thank you for
your attention!